

CLAIMS

Having described the preferred embodiments, the invention is now claimed to be:

1. A tracking method for tracking a local wireless device in a medical facility having a medical facility network (10), the tracking method comprising:

detecting the local wireless device (50, 51, 52), which is not connected with the medical facility network (10), based on local wireless communication (54, 55, 56, 58) between the local wireless device and at least one nearby network device (12, 14, 16) that is connected with the medical facility network; and

estimating a location of the local wireless device within the medical facility based on the local wireless communication and information indicative of a location of the at least one nearby network device.

2. The tracking method as set forth in claim 1, further including:

determining locations of a plurality of network devices (12, 14, 16, 18) that are connected with the medical facility network, the plurality of network devices including the at least one nearby network device (12, 14, 16).

3. The tracking method as set forth in claim 2, wherein at least some of the plurality of network devices (12, 14, 16, 18) are wireless network devices wirelessly connected with the medical facility network (10), and the determining includes:

estimating locations of the wireless network devices based on wireless network connections (36) between the network devices and the medical facility network.

4. The tracking method as set forth in claim 3, wherein the wireless network connection (36) comports with an IEEE 802.11 based wireless protocol.

5. The tracking method as set forth in claim 1, wherein the local wireless communication (54, 55, 56, 58) between the local wireless device (50, 51, 52) and the at least one nearby network device (12, 14, 16) employs at least one of: (i) an IEEE 802.15.1 wireless protocol; and (ii) an 802.15.4 wireless protocol.

6. The tracking method as set forth in claim 1, wherein, prior to the detecting, the local wireless device (50, 52) and the nearby network device (12, 14) establish a local wireless communication connection (55, 58) therebetween, and the estimating includes:

estimating the location of the local wireless device (50, 52) as substantially coinciding with the location of the nearby network device (12, 14).

7. The tracking method as set forth in claim 1, wherein the estimating includes:

estimating a distance between the local wireless device (50, 51, 52) and the at least one nearby network device (12, 14, 16) based on a strength of a wireless signal employed in the local wireless communication (54, 55, 56, 58).

8. The tracking method as set forth in claim 1, wherein the at least one nearby network device includes a plurality of nearby network devices (14, 16) that detect the local wireless device (51), and the estimating includes:

estimating a distance between the local wireless device (51) and each nearby network device (14, 16) based on the local wireless communication (54, 56); and

estimating a location of the local wireless device (51) based on the estimated distances and the locations of the nearby network devices (14, 16).

9. The tracking method as set forth in claim 1, wherein the estimating includes:

estimating a distance between the local wireless device (50, 51, 52) and the at least one nearby network device (12, 14, 16) based on a maximum communication distance of the local wireless communication (54, 55, 56, 58).

10. The tracking method as set forth in claim 1, wherein the estimating includes:

estimating the location of the local wireless device (50, 52) as being within a room of the medical facility containing the nearby network device (12, 14).

11. The tracking method as set forth in claim 1, further including:

repeating the detecting;

during a subsequent detecting, identifying a change in the local wireless communication (54, 55, 56, 58) between the local wireless device (50, 51, 52) and the at least one nearby network device (12, 14, 16); and

updating the location of the local wireless device (50, 51, 52) within the medical facility based on the change.

12. The tracking method as set forth in claim 11, wherein the change includes one of:

loss of local wireless communication between the local wireless device (50, 51, 52) and at least one nearby network device (12, 14, 16) during the subsequent detecting, and

pickup of a new local wireless communication between the local wireless device (50, 51, 52) and a network device (18) other than the at least one nearby network device (12, 14, 16) of the initial detecting.

13. The tracking method as set forth in claim 1, wherein (i) the at least one nearby network device (12, 14, 16) is part of a plurality of wireless network devices (12, 14, 16, 18) wirelessly connected with the medical facility network (10), (ii) the information indicative of the location of the at least one nearby network device is part of information indicative of the locations of the plurality of wireless network devices, and (iii) the tracking method further includes:

repeating the detecting and estimating for a plurality of local wireless devices (50, 51, 52) not connected with the medical facility network (10) to estimate a location for each local wireless device; and

combining the estimated locations of the plurality of local wireless devices (50, 51, 52) and the information indicative of the locations of the plurality of wireless network devices (12, 14, 16, 18) to generate an integrated database of device locations.

14. The tracking method as set forth in claim 1, further including:

superimposing the estimated location of the local wireless device (50, 51, 52) on a map (90) of at least a portion of the medical facility to provide a visual indication of the estimated location.

15. A tracking system for tracking a local wireless device in a medical facility having a medical facility network (10), the tracking system comprising:

a means (64, 66, 68, 70) for detecting the local wireless device (50, 51, 52), which is not connected with the medical facility network (10), based on local wireless communication (54, 55, 56, 58) between the local wireless device and at least one nearby network device (12, 14, 16) that is connected with the medical facility network; and

a means (60) for estimating a location of the local wireless device (50, 51, 52) within the medical facility based on the local wireless communication (54, 55, 56, 58) and information indicative of a location of the at least one nearby network device (12, 14, 16).

16. The tracking system as set forth in claim 15, wherein the at least one nearby network device (12, 14, 16) is part of a plurality of network devices (12, 14, 16, 18) that are connected with the medical facility network (10), at least some of the plurality of network devices being wireless network devices wirelessly connected with the medical facility network, the tracking system further including:

a network devices tracking system (38) that tracks locations of at least the wireless network devices (12, 14, 16, 18).

17. The tracking system as set forth in claim 16, wherein the network devices tracking system (38) performs the location tracking based on wireless network connections (36) between the wireless network devices (12, 14, 16, 18) and the medical facility network (10).

18. The tracking system as set forth in claim 15, wherein the means (64, 66, 68, 70) for detecting the local wireless device (50, 51, 52) includes:

local wireless communication hardware (64) installed in or integrated with the local wireless device (51) and employing a selected non-network local wireless communication protocol; and

local non-network wireless communication hardware (66, 68) installed in or integrated with the at least one nearby network device (14, 16) and employing the selected non-network local wireless communication protocol.

19. The tracking system as set forth in claim 18, wherein the selected non-network local communication protocol is one of: (i) an 802.15.1 protocol, and (ii) an 802.15.4 protocol.

20. The tracking system as set forth in claim **18**, wherein the means **(64, 66, 68, 70)** for detecting the local wireless device **(50, 51, 52)** further includes:

client software **(70)** installed on the at least one nearby network device **(12, 14, 16)** that causes the at least one nearby network device to scan for other devices in range that are capable communicating using the selected non-network local communication protocol.

21. The tracking system as set forth in claim **15**, further including:

a digital map **(90)** of the medical facility; and

a graphical display **(30)** capable of displaying the digital map with the estimated location of the local wireless device **(50, 51, 52)** superimposed thereon.